



# **Citadel Project Area**

## **Draft Environmental Impact Statement**

### **Appendix C**



#### **Design Criteria and Monitoring**

## Design Criteria Applicable to Activities Under All Action Alternatives

Forest Plan standards and guidelines, Regional Watershed Conservation Practices (WCPs, Forest Service Handbook 2509.25), and other management requirements apply to the proposed activities. Other management requirements such as applicable Forest Plan standards are repeated here only if clarification is required.

Applies To:	Measure
All Activities	<b>Brush Disposal:</b> <ul style="list-style-type: none"> <li>Disposal of slash piles created through timber harvest or fuel treatments would be funded appropriately. Rehabilitation of pile sites would include site preparation and seeding to return the sites to productivity and control the spread of noxious weeds.</li> </ul>
	<b>Heritage Resources:</b> <ul style="list-style-type: none"> <li>All culturally sensitive areas, Traditional Cultural Properties, potential graves and sites eligible or potentially eligible to the National Register of Historic Places would be avoided under proposed activities with a 60-meter (200-foot) buffer. Other mitigation identified in the project file for each property would be required during implementation of the project. Heritage site locations and specific mitigations are outlined in the National Historic Preservation Act, Section 106 compliance reports (Smith et al 2005). Heritage site locations are not identified in this EIS to protect site integrity.</li> <li>In the event that culturally sensitive areas, Traditional Cultural Properties, potential graves, or sites eligible or potentially eligible to the National Register of Historic Places cannot be avoided, or new heritage resources are found during implementation of the project, the District Project Staff will stop all activity in the affected area and notify the District Archeologist. Appropriate consultation with the State Historic Preservation Office, Tribal Historic Preservation Offices, Native American Tribes, American Indians, and other applicable parties would take place as directed by Section 106 of the National Historic Preservation Act.</li> <li>Leaders of project activities described in this EIS would review the heritage report and geospatial data for areas to protect and specific mitigations. Project leaders should then contact district heritage staff for additional assistance in marking the sites for protection on the ground.</li> </ul>
	<b>Improvements:</b> <ul style="list-style-type: none"> <li>All Forest Service-authorized improvements, such as fences and water developments, would be shown as protected improvements on timber sale area maps and protected during management activities.</li> <li>Protect all documented NFS land boundary corners, posts, and bearing trees.</li> <li>Provide access routes as needed for utility line construction, reconstruction, and maintenance of existing right-of-way corridors.</li> <li>Avoid or protect utility infrastructure in project area during project implementation.</li> <li>Avoid or protect improvements under special use permit.</li> <li>Protect all mining corner posts and active mining claim developments.</li> </ul>
	<b>Noxious Weeds:</b> <ul style="list-style-type: none"> <li>Contracts and permits issued as part of this project would include measures to limit spread of noxious weeds. Where proposed activities would occur in areas infested with noxious weeds considered to be at high risk for spread, off-road equipment associated with the activity would be washed before leaving the site to prevent spread of weeds to adjacent NFS and private lands. Known areas meeting these criteria would be identified by District staff before completion of any timber sale contract associated with this project. Known weed infestations will be displayed on the timber sale map.</li> <li>Where ground-disturbing activities would occur in areas infested with weeds, weeds would be treated before project implementation, when feasible, to reduce future spread and establishment of noxious weeds.</li> <li>Review of the area for noxious weed infestations would continue during management activities. If new noxious weed infestations that could be spread by management activities are found during implementation, actions to minimize spread would be taken.</li> </ul>
	<b>Public Safety:</b> <ul style="list-style-type: none"> <li>Appropriate signing or other cautionary measures would be implemented in conjunction with all management activities to ensure public safety.</li> </ul>

Applies To:	Measure
	Implementation of these measures would be the responsibility of the person initiating the action (e.g., logging contractor, prescribed fire manager).
	<b>Range:</b> <ul style="list-style-type: none"> <li>Managers of vegetation treatment projects would consult with District range managers to ensure alteration of natural barriers does not allow livestock to circumvent fences.</li> </ul>
	<b>Rare Plant Species:</b> <ul style="list-style-type: none"> <li>Any suitable habitat outside of treatment units would be avoided unless approved by a qualified botanist for entry.</li> </ul>
	<b>Recreation:</b> <ul style="list-style-type: none"> <li>Non-motorized trails would be shown as protected improvements on timber sale maps. Project administrators would ensure protection of trails during project implementation.</li> </ul>
	<b>Revegetation:</b> <ul style="list-style-type: none"> <li>Native vegetation would be retained to the maximum extent possible during proposed activities.</li> <li>Disturbed soil would be revegetated in a manner that optimizes plant establishment for that specific site. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and placement of weed-free mulch as necessary. Revegetation would be initiated as soon as possible, generally not to exceed 6 months, after termination of ground-disturbing activities. All disturbed soils would be revegetated with native species when available using seed mixtures free of noxious weeds. On areas needing the immediate establishment of vegetation, non-native, non-aggressive annuals, non-aggressive perennials, or sterile perennials may be used until native perennials become established. These species can be used to prevent the spread of noxious weeds and prevent erosion. Only weed-free mulch would be used.</li> </ul>
	<b>Scenery:</b> <ul style="list-style-type: none"> <li>Activity slash would be reduced to natural levels within 300 feet of NFSRs 101, 113, 134, 214, and 222 unless not visible due to changes in topography. Slash would be treated within 1 year of harvest completion.</li> </ul>
	<b>Snags:</b> <ul style="list-style-type: none"> <li>Snags would be cut only for safety reasons and when necessary for construction of roads, skid trails, firelines, and log landings. Snags over 20 inches DBH and those with cavities would be cut only for safety reasons.</li> </ul>
	<b>Soil and Water:</b> <ul style="list-style-type: none"> <li>Some proposed activities would take place on soils identified as having a potential for severe erosion. The following special provisions, intended to minimize the amount of exposed bare soil, off-site transport, and soil displacement, would apply: (1) heavy equipment would avoid streams and swales except to cross at designated points, build crossings, or conduct restoration, unless protected by at least one foot of packed snow or two inches of frozen soil; (2) on slopes over 30 percent, harvesting and skidding methods that minimize the amount of soil displaced into piles or windrows would be used in order to leave soil intact and in place; (3) prescribed burns on slopes over 30 percent would be conducted when soil, duff, and large fuels are sufficiently moist to retain beneficial duff as ground cover for prevention of erosion.</li> </ul>
	<b>Wildlife:</b> <ul style="list-style-type: none"> <li>No treatments would be conducted within 500 feet of mine openings to maintain microclimate of bat hibernacula or nurseries. Specific site locations are documented in the Wildlife Specialist Report and BA/BE in the project file.</li> <li>Avoid ground disturbance within 100 feet of an opening of a natural cave. Specific site locations are documented in the Wildlife Specialist Report and BA/BE in the project file.</li> <li>While any projects resulting from this analysis are taking place, all gates that would normally be closed during big game firearm hunting seasons would be kept closed during these seasons and one week before the seasons except to allow administrative traffic to pass. Gates would be closed again immediately after traffic passes.</li> <li>Any newly discovered raptor nests, or potential bat roosts or hibernacula found during project layout or implementation would be evaluated by a qualified biologist on a site-specific basis to determine if special requirements are warranted to protect site integrity.</li> </ul>

Applies To:	Measure
	<ul style="list-style-type: none"> <li>Disturbance of any newly discovered colonies of land snails would be avoided. The District wildlife biologist would determine appropriate buffer areas around newly discovered colonies based on site-specific conditions. Buffer sizes would be determined on a case-by-case basis depending on the size of the colony, the potential for adjacent areas to provide snail habitat, and the potential for negative effects to that specific colony.</li> <li>Any new goshawk nests found during project implementation would be protected in accordance with Forest Plan direction.</li> <li>Vegetation management activities within goshawk nest areas shall be limited to those that maintain or enhance the stand's value for goshawk.</li> <li>From April 1 through August 15, minimize additional human-caused noise and disruption beyond that occurring at the time of nest initiation (e.g. road traffic, timber harvests, construction activities) within one-half mile of all active goshawk nests until the nest has failed or fledglings have dispersed. Consult with the district Wildlife Biologist to determine whether this Standard will apply, depending upon the goshawk territory activity in the spring.</li> <li>Project activities which are occurring within known goshawk territories during the winter must be minimized beginning April 1 to allow for the territory to become occupied.</li> <li>Incorporate Watershed Influence Zone (WIZ) Best Management Practices (BMPs) for the protection of Northern Leopard Frog habitat.</li> <li>Avoid creating barriers (e.g. new open roads) between red-bellied snake hibernacula and wetlands.</li> <li>In vegetation treatment units, 1 pile of woody material per 2 acres would be left to create near-ground structure for small mammal species, except within 300 feet of buildings.</li> </ul>
<b>Timber Harvest</b>	<p><b>Rare Plant Species:</b></p> <ul style="list-style-type: none"> <li>To protect rare plants, logs would not be skidded through hardwood communities unless the hardwood stand is being treated (commercial or non-commercial pine removal for hardwood enhancement).</li> <li>Any skid  temporary roads, and landings in suitable sensitive plant habitat would be designated in consultation with a qualified botanist.</li> </ul>
	<p><b>Harvest:</b></p> <ul style="list-style-type: none"> <li>Existing pine regeneration would generally be protected in stands proposed for overstory removal harvest. Provisions related to felling, bucking, and whole tree yarding would be included in the timber sale contract. Log length yarding is the preferred method of timber removal. Skid trails within these stands would be approved  the sale administrator before commencement of logging. Landing locations would, where feasible, take advantage of existing openings or areas with no regeneration.</li> <li>To increase the likelihood of successful conifer regeneration, stands proposed for seed cuts would be logged in the summer or early fall where feasible to maximize the site scarification provided by the skidding operation, provided there are no concerns related to riparian areas, noxious weeds, or sensitive plants. Cutting would be done in such a way that areas would be restocked with trees within five years after harvest.</li> <li>Where stand variation dictates an alternative treatment to the majority treatment, this variation shall be accommodated. For example, a quarter acre pocket of aspen within a commercial thin stand of ponderosa pine shall be cleared of conifers within and up to 30 feet from the edge of the pocket.</li> </ul>
	<p><b>Road Restrictions:</b></p> <ul style="list-style-type: none"> <li>Timber sale units would be laid out to facilitate existing road restrictions (for example, trees around gates and other barriers would be left uncut to maintain obstructions and discourage driving around the gate or barrier).</li> </ul>
	<p><b>Scenery:</b></p> <ul style="list-style-type: none"> <li>Layout and marking of timber sale units would comply with forest-wide marking guides in effect at the time of implementation.</li> <li>Where treatments would be visible from Interstate 90, edges of treatment units would be feathered into untreated stands to mimic natural forest/opening edge typically found in this landscape. Affected areas are mapped in the project file.</li> <li>Where possible, treatments would be designed to reduce the chance of wind damage to residual trees. This may include retaining higher density of mature trees on exposed ridges, lee slopes, and other areas prone to high winds and heavy snow accumulation.</li> </ul>

Applies To:	Measure
	<ul style="list-style-type: none"> <li>Where possible, log decks would be located at least 300 feet from NFSRs 101, 113, 134, 214, and 222.</li> <li>To reduce effects of continuously even tree spacing on wildlife and scenery, commercial thin treatments would emphasize tree health and crown size over spacing. Residual trees in overstory removal and seed cut units would be variably spaced.</li> <li>Skyline logging corridors would be as narrow as possible to minimize visual effects of any soil displacement.</li> <li>Where existing conditions allow, treatments in forested areas adjacent to other ownership would blend into adjacent conditions rather than creating strong lines. A horizontal transition zone of 1.5 times the height of the overstory is suggested.</li> </ul>
	<b>Snags and Down Logs:</b> <ul style="list-style-type: none"> <li>Any snags cut as safety hazards would be left on site rather than salvaged or skidded to landings. Timber sale contract provisions would be used to protect snags.</li> <li>To ensure provision of down woody material, 50 or more linear feet of logs at least 10 inches in diameter would be left on-site following all commercial treatments.</li> </ul>
	<b>Range:</b> <ul style="list-style-type: none"> <li>All pasture gates would be identified on Timber Sale Area maps and kept closed during the grazing season (June through October). Maintained fences would be protected during logging operations.</li> <li>If log hauling or movement of heavy equipment related to the proposed timber harvest causes damage to cattleguards, the timber purchaser would be responsible for repair.</li> </ul>
	<b>Recreation:</b> <ul style="list-style-type: none"> <li>Snowmobile trails would be shown as improvements on timber sale area maps and protected during harvest operations. An evaluation of the potential for conflicts between logging and trail use would take place at the time of timber sale appraisal and contract preparation. If conflicts appear likely between use of the snowmobile trails and specific logging units or haul routes, logging would be restricted between December 15 and March 31 unless a logical and desirable alternative snowmobile route is identified. Only those units and/or roads in conflict would be restricted so that logging operations could proceed in the remainder of the sale area.</li> <li>Winter operations of timber sale units that necessitate skidding across a snowmobile trail but do not otherwise affect the trail may be allowed. Determination would be made on a case-by-case basis, with crossings permitted only at locations approved by the sale administrator and with proper cautionary signing installed by the timber contractor.</li> </ul>
	<b>Soil and Water:</b> <ul style="list-style-type: none"> <li>Slash in and install waterbars, where necessary, on skid trails following harvest activities.</li> </ul>
	<b>Wildlife:</b> <ul style="list-style-type: none"> <li>Locate skid trails away from known sensitive snail locations. Retain overstory sufficient to maintain moisture regimes, ground-level temperatures, and humidity. Retain ground litter, especially deciduous litter if available. Specific site locations are documented in the Wildlife Specialist Report and BA/BE in the project file.</li> </ul>
<b>Prescribed Fire</b>	<b>Burn Plan:</b> <ul style="list-style-type: none"> <li>Prescribed burning would be implemented only under conditions defined in a prescribed burn plan.</li> <li>The District Silviculturist will assist with the preparation of or review the final prescribed burn plan.</li> </ul>
	<b>Heritage Resources:</b> <ul style="list-style-type: none"> <li>Heritage resource inventory would be completed in proposed burn units prior to implementation per FS Agreement No. 01-MU-11020000-015 (Programmatic Agreement Among the Advisory Council on Historic Preservation, the Colorado, Wyoming, South Dakota, Nebraska, and Kansas SHPOs, and the USDA Forest Service Rocky Mountain Region Regarding Implementation of the Prescribed Fire Program).</li> </ul>
	<b>Improvements:</b> <ul style="list-style-type: none"> <li>Utility lines and any other improvements within the burn unit would be protected during prescribed burns.</li> </ul>

Applies To:	Measure
	<b>Rare Plant Species:</b> <ul style="list-style-type: none"> <li>Suitable plant habitat (which includes known Sensitive plant and plant species of local concern occurrences) adjacent to or within prescribed burn units would not be directly ignited. These areas are included and identified in the design criteria shapefile (available in the Citadel project file).</li> <li>Control lines that disturb soil (i.e. hand or dozer lines) would not be located in suitable plant habitat. Wet line or black line may be used in certain locations (e.g. control lines G, H, and L).</li> </ul>
	<b>Soil and Water:</b> <ul style="list-style-type: none"> <li>Prescribed burns in some sites would take place all or partly on soils with severe erosion hazard. These burns would take place only when burn severity could be kept low.</li> <li>Small wetlands located in or immediately adjacent to any burn units would be excluded from areas to be burned and protected from disturbance.</li> </ul>
	<b>Scenery:</b> <ul style="list-style-type: none"> <li>Where possible, prescribed burns adjacent to NFSRs 101, 113, 134, 214, and 222 would be burned so that overstory trees visible from the road show as little scorch as possible.</li> </ul>
	<b>Wildlife:</b> <ul style="list-style-type: none"> <li>Prescribed burns within ½ mile of historic goshawk nests would be coordinated with district wildlife biologist. Timing restriction would apply from April 1 through August 15 if the nest is active.</li> <li>All documented land snail colony locations in prescribed burn units would be protected by burning when snails are hibernating (&lt;50 degree Fahrenheit) and by using a fast-moving fire.</li> <li>Prescribed burning in areas with caves or mines would be coordinated with district wildlife biologist. Impacts to bat hibernacula would avoided be by not burning during winter months and by black lining mine openings prior to ignition of the main unit. Specific site locations are documented in the Wildlife Specialist Report and BA/BE in the project file.</li> <li>During prescribed burning, protect existing guzzler locations through whichever means (foam, black lining, wrapping, etc.) the burn boss deems appropriate based on site conditions. Specific guzzler locations can be found in the Wildlife Specialist Report and BA/BE in the project file.</li> <li>Consider habitat (survey as appropriate) of regal fritillary and Atlantis fritillary butterflies prior to prescribed burning on prairies or meadows. This is especially important for prescribed burns scheduled from September through April. Design the project to conserve important habitat components of known sightings.</li> <li>Conduct prescribed burns on no more than 60% of contiguous meadow at a time and burn in early spring or fall. If newly discovered sighting of Regal fritillary occur in burn unit, re-design the project to conserve important habitat components of known sightings.</li> </ul>
	<b>Range:</b> <ul style="list-style-type: none"> <li>To avoid conflicts with grazing, and to ensure that prescribed fire mitigation is implemented, prescribed fire projects will be coordinated in advance with the range management specialist.</li> </ul>
<b>Transportation System</b>	<b>Dust Control:</b> <ul style="list-style-type: none"> <li>Dust control, if necessary, may be done with water, magnesium chloride, calcium chloride, or equivalent.</li> </ul>
	<b>Noxious Weeds:</b> <ul style="list-style-type: none"> <li>District staff responsible for the noxious weed program would, in coordination with the project engineer, inspect gravel pits for noxious weed infestation before transport and use of gravel and other material. Infestations would be treated to prevent spread.</li> <li>District staff responsible for the noxious weed program would inspect stockpiled gravel annually for weed infestation in coordination with the project engineer.</li> </ul>
	<b>Revegetation:</b> <ul style="list-style-type: none"> <li>Timber sale roads would be seeded after construction but before timber harvest if any part of the gap between construction and harvest would occur between April and October. This may be accomplished under the road contract. If necessary, seeding would again occur after use of the road is complete. Seeding may be delayed until after completion of harvest if the gap between construction and</li> </ul>

Applies To:	Measure
	harvest would be of short duration and hydrology, soils, engineering, and noxious weed specialists determine after field review that a delay would be acceptable.
	<p><b>Soil and Water:</b></p> <ul style="list-style-type: none"> <li>• New road construction should be designed to limit cut and fill slopes where possible, particularly when located above steep slopes.</li> <li>• Construction of landings, roads, and tractor and skid trails would be avoided within 100 feet (or a distance equal to the mean height of mature dominant late-seral vegetation, whichever is more) of perennial seeps, springs, and wetlands. If this is not possible, crossings would be constructed and restored to prevent headcutting, gullying, erosion, and sediment transport to ephemeral or perennial channels.</li> <li>• Creation of large water collection points, such as road ditches or excessively large water bars, would be avoided, particularly up-gradient of existing rotational slumps and landslides. A greater frequency of smaller water bars than that recommended in FSH 2509.25 may be used. Temporary road cuts exceeding two feet would be avoided. If this is infeasible because of steep slopes, temporary roads would be recontoured.</li> <li>• Where feasible, existing haul roads would be reconstructed with rolling grades instead of ditches and culverts.</li> <li>• Water bars and sediment barriers would be placed 10 to 20 feet below water bar outlets and culvert outlets on skid trails steeper than 15 percent.</li> <li>• Engineering staff would consult with a forest hydrologist and fisheries biologist on design of stream crossings. Fill slopes would be protected with riprap, gabions, prompt seeding, or other measures approved by the hydrologist, fisheries biologist, and soil scientist. Placement of structures would comply with federal and state laws regarding construction in and near waterways, including placement of fill and measures to control sedimentation.</li> </ul>
	<p><b>Travel Management:</b></p> <ul style="list-style-type: none"> <li>• All newly constructed roads and skid trails would be closed following construction until needed for timber sale or related activities and closed again after use. Roads needed for timber sale or related activities but normally closed to motorized vehicles would also be closed when not in use. All newly constructed roads will be closed in the following way: 1) After road construction has been completed, the road will be closed with large rocks buried 1/3 depth in the road. This will be accomplished as part of the road construction package, 2) After timber sale has been completed the first 300'-500' of the road will be re-contoured to the original ground slope. This will be accomplished as a KV project.</li> <li>• Where new roads are constructed through existing range allotment fences to access timber sale units, temporary cattle guards will be installed at the crossing point. Immediately following completion of the timber sale and all related activities, the cattle guard would be removed and the fence returned to its original condition. Cattle guards would not be replaced with any form of gate.</li> <li>• Avoid or protect utility infrastructure during construction and decommission of roads.</li> </ul>

## Monitoring for All Action Alternatives

The Northern Hills Ranger District would monitor implementation of the selected alternative.

The timber sale administrator or other contract administrators would complete some of the project implementation monitoring. Other resource specialists would be involved in monitoring of specific mitigation measures relating to their particular resource area. Specific monitoring requirements are listed below.

- The district archeologist would monitor known heritage sites eligible or potentially eligible to the National Register of Historic Places before and after project implementation.
- Prescribed fire managers would establish photo points in prescribed burn units to compare pre- and post-treatment conditions and document fire behavior during implementation.
- Fuels staff would evaluate effectiveness of fuel treatments in reducing fuel loading.
- Fire managers would evaluate burned areas to establish a timeline for maintenance burning.
- Project managers would monitor revegetation of disturbed and burned areas to determine need for additional measures and noxious weed control.
- Wildlife staff would monitor known and suspected goshawk nests annually for nesting activity.
- Engineering and hydrology/soils specialists would monitor effectiveness of erosion control measures (seeding, water bars, etc.) one and three years following installation.
- Hydrology/soils staff would monitor soil compaction at a sample of timber sale landings and harvest units.
- Timber sale administrators and hydrology/soils specialists would monitor application and effectiveness of Best Management Practices.
- The district planning team would monitor timber sale layout to evaluate project implementation and assumptions used in the planning process. The district planning team would monitor timber sale implementation following sale closure.